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INTERNATIONAL TRADE IN SERVICES AND DEREGULATION OF DOMESTIC MARKETS

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INTERNATIONAL TRADE IN SERVICES AND DEREGULATION OF DOMESTIC MARKETS *

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1. Introduction

Outside the field of macro-economics, two policy issues have stirred up intense public debates in recent years: the first, liberalization of international trade in services, and the second, deregulation of domestic markets.

The debate on international services gained momentum in November 1982 at the GATT ministerial meeting when the United States came out very strongly in favor of including services (in addition to agriculture) in the next round of trade negotiations. While the initial reaction was somewhat reserved even among other industrial nations, the need to free international trade in services has gradually become accepted by a large majority of the contracting parties to GATT. Indeed, the ministerial conference in Punta del Este, which launched the Uruguay Round established the Group of Negotiations on Services in parallel to the Group of Negotiations on Goods. In the course of the next four years both of these groups will search for new rules of international trade in goods and services.[1]

Public discussions of domestic deregulation somewhat predated the international services debate. Beginning in the late 1970, a number of developed countries, especially the United States and the United Kingdom, took a whole series of policy measures whose purpose was to increase the scope and the degree of competition in various sectors. Thus in the

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[1] Strictly speaking the services negotiations are not conducted within the GATT framework but outside it. Only at the end of the negotiations a decision will be taken whether services should become a part of the GATT-based international trading system. It is also worth mentioning that what is being negotiated now is not a dismantling of barriers to services trade but general rules by which such trade should be governed. To use a historical parallel, we are with regard to services today where we were with regard to goods in the period of the Havana Charter negotiations. Clearly, at least 10 years will have passed before any actual deregulation of services trade takes place.

United States we witnessed the passage of the Airline Deregulation Act of 1978, new truck and railroad legislation, the establishment of new rules for charging stock brokerage commissions, and the divestiture of Bell Operating Companies from AT&T. In England the most important instance of market deregulation has come to be known as Big Bang; it involved de-cartelization of the London Stock Exchange mainly though the abolition of fixed commissions and of single capacity.[2]

Other European countries, most notably France under its present conservative government, follow the lead established by the United States. Interestingly enough, deregulation of industries in Europe often goes hand in hand with privatization.

The connection between deregulation of industries and international trade in services has hardly ever been made. And yet, by and large the industries being deregulated provide services - air and railway transportation, insurance, banking, telecommunications and so on - and they do so not only for domestic markets but also for exports. Policy makers seem to separate their discussions and implementation of market deregulation from liberalization of services trade. The first process proceeds at a much faster pace than the second. This is quite understandable for a government committed to enlarging the role of the free market generally has more power and less constraints to form a domestic policy than to shape rules of the game in the international arena. Most policy makers would probably argue that the connection, even if it existed, need not be taken into account for the freer domestic economy the more competitive it is bound to be in foreign markets.

The purpose of this paper is to look at one possible

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[2] A comprehensive discussion of the recent U.S. experience with deregulation is provided in Bailey (1986). The British experience is discussed in Kay and Thompson (1986), Yarrow (1985) and Vickers and Yarrow (1985).

connection between domestic market deregulation and international competitiveness. Following the work of Brander (1981), Brander and Krugman (1984), Brander and Spencer (1984) and Krugman (1984), I develop a simple model which shows that an increase in competition in an internal market may actually hurt the country's international performance in the same sector. [3] As a result, a deregulated service industry can turn into a net importer from a net exporter. I also establish that the domestic liberalization of a service industry may lead to lower domestic prices but also higher international prices. Thus, for example, more competition among domestic airlines in the United States results in the model developed here in lower domestic fares say from New York to Miami, Florida; but at the same time the change gives rise to higher international airfares say from New York to Geneva. Among other findings is that subsidization of domestic carriers hurts the airlines with joint international and domestic flights.[4]

The basic results of this paper follow from the assumed existence of economies of scope. Deregulation of the domestic market encourages new entries. If the international market continues to be regulated, these new firms are limited to supplying the local market. This erodes the external competitive position of the supplier(s) who serves the domestic and the international markets.

2. The Model

To imagine the setting of the problem more easily,

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[3] Our model is different from the ones referred to because we introduce economies of scope and also make a distinction between traded and non-traded services.

[4] I must state categorically that my research has not been financed by any airline. Nor have I been promised a free trip, only a free meal if I become a passenger.

assume that we deal with passenger air transportation.[5] There are only two countries in the world; one is small and shall be called Switzerland, the other is large and will be named the United States. The small country is small in the sense of having no domestic flights. Switzerland is, in the limit, a good example of such a country; city-states such as Singapore or Hong-Kong would be the ideal cases in point.

The domestic market for air transportation services in the United States can be characterized as follows: This sector is non-traded by the nature of the existing regulations and barriers to entry. Domestic entry is also regulated. To begin with there is only one American airline called just that American Airlines. The demand schedule for domestic air transportation is assumed linear:

$$(1) \qquad P_2^* = a - bD_{12}^*$$

Note that the demand function is written in the inverted form i.e. as the airfare on domestic flights that U.S. residents are willing to pay for a given quantity of services, D_{12}^*. In order to avoid the so called integer problem, suppose that the output of the industry in question is not measured by the number of flights but by the number of passenger-miles. There are many domestic routes so any distance can be accommodated.

In addition to those U.S. residents who desire domestic air transportation services, there is also another group of individuals in the United States, completely independent, who take only international flights. As already stated, the Swiss

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[5] The choice of the air transportation industry is for a purely illustrative purpose. The main feature of the model developed in this paper is that there are domestic and international markets, and these markets are segmented, to some extent both on the demand and the supply side. Indeed this happens in air transportation. But other examples can be offered as well, for instance domestic and international trucking. A very interesting example is provided by telecommunications with local and long-distance services.

demand only international services. The demand for international services can be accommodated either by American Airlines or Swissair, Switzerland's national carrier. When the two demand schedules are aggregated, one obtains [6] :

$$(2) \qquad P_1^* = a - b\,(D_1 + D_{11}^*)$$

where P_1^* is the international airfare, D_1 stands for the quantity of services demanded by Swiss residents and D_{11}^* denotes the amount of international services demanded by Americans. For the ease of figuring, I have made the U.S. domestic market equal in size to the combined U.S.- Swiss international market. The latter market can be, for the time being, viewed in global terms; we need not yet concern ourselves with the relative size of the two countries.

On the supply side, both Switzerland and the United States have initially only one airline, Swissair and American Airlines, respectively. In absence of demand for domestic flights, Swissair provides only international service while American Airline offers domestic as well as international flights.

In our description of a service industry two market structures co-exist side by side: monopoly in a domestic economy and duopoly in the international market. I find this combination to be an appealing description of certain services. Domestic transportation is a sheltered or a non-traded sector, while a basically identical service- international passengers transportation - is exposed to world competition. In both markets the degree of competition is limited.

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[6] Of course I assume that international passengers consider Swissair and American Airlines services identical in every respect. The choice of the airline is determined by flipping a coin.

In order to describe market equilibrium, the rules of the game have to be further specified. It will be assumed through the paper that the players are engaged in a Cournot game. The airlines choose the optimal amount of service for a particular market without concern for effects of their moves. I have no additional defence for this type of strategy beyond the usual arguments and the fact that it is a prelevant assumption in international organization. Having selected the dominant strategy, the profit functions can be readily stated as:

$$(3)\quad \Pi_1 = [a - b(X_1 + X^*_{11})]X_1 - TC(X_1)$$

$$(4)\quad \Pi^*_1 = [a - b(X_1 + X^*_{11})]X^*_{11} + (a - bX^*_{12})X^*_{12} - TC(X^*_{11} + X^*_{12})$$

Where Π_1 and Π^*_1 denote total profits of Swissair and American Airlines, X_1 denotes the Swissair's supply, while X^*_{11} and X^*_{12} represent American Airlines' supply on the international and domestic markets respectively. In setting up the profit functions we use the equilibrium conditions $D_1 + D^*_{11} = X_1 + X^*_{11}$ and $D^*_{12} = X^*_{12}$.

The total cost functions are written in a general form, however, they are said to display economics of scale and of scope. [7] Given the total cost functions, the marginal costs

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[7] Panzar and Willig (1981) greatly contributed to a recent interest in economies of scale. They define the relevant concept as follows: "There are economies of scope where it is less costly to combine two or more product lines in one firm than to produce them separately." Possibility to share or jointly utilize an input to the production process is usually given as the main theoretical reason for the existence of economies of scope. See Bailey and Friedlaender (1982) for a review of the field.

will be assumed $(c-eX_1)$ for Swissair and $[c-e(X^*_{11}+X^*_{12})]$ for American Airlines. The coefficient e, assumed to be greater than zero, captures economics of scale and of scope.[8] It is immediately evident that in spite of the two airlines being potentially equally efficient, having the whole or a part of the domestic traffic gives one airline a cost advantage in the international market.

The first order conditions for profit maximization are obtained by differentiating equations (3) and (4) with respect to X_1, X^*_{11} and X^*_{12}.

$$(5)\quad (e-2b)X_1 - bX^*_{11} = c-a$$

$$(6)\quad (e-2b)X^*_{11} - bX_1 + eX^*_{12} = c-a$$

$$(7)\quad (e-2b)X^*_{12} + eX^*_{11} = c-a$$

Solving the system simultaneously yields equilibrium values of the three endogenous variables. Before producing the solution, it may be useful to give the geometric representation of the equilibrium conditions.

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[8] The total cost functions consistent with our assumptions can be readily derived. Suppose that there only two products or services, X_1 and X_2. The total cost functions of producing X_1 and X_2 separately are:

$$TC_1 = cX_1 - 0.5\ eX_1^2 \qquad TC_2 = cX_2 - 0.5\ e\ X_2^2$$

Now, when the two product lines are combined, total cost becomes:

$$TC = c(X_1+X_2) - 0.5\ e(X_1^2 + X_2^2) - e\ X_1X_2$$

It can be seen that the above specification contains economies of scale as well as economies of scope.

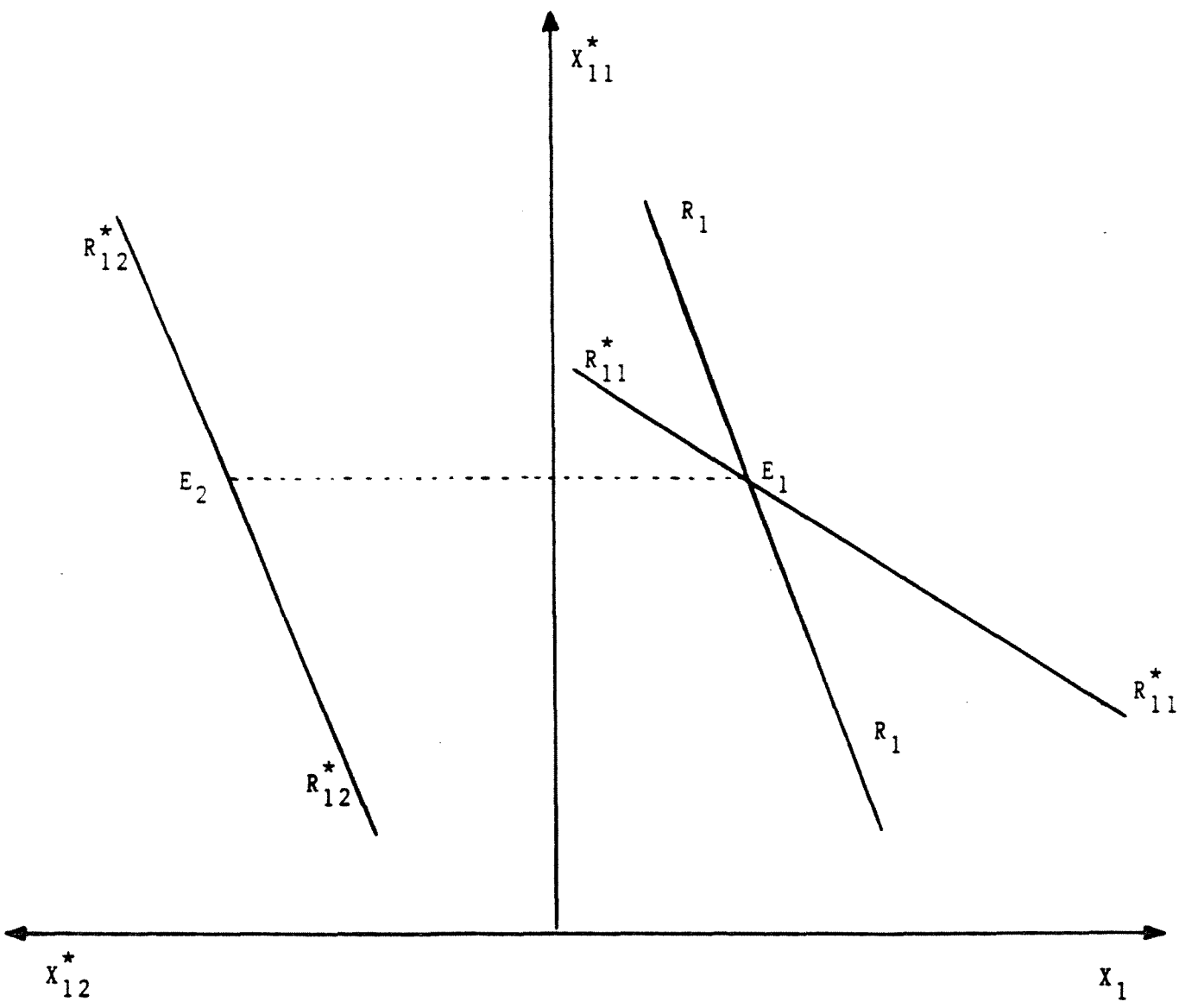

Figure 1

The three curves in Figure 1, $R^*_{12}R^*_{12}$, $R^*_{11}R^*_{11}$ and R_1R_1, represent respectively the reaction function of American Airlines in the domestic market, its reaction function in the international market; and finally Swissair's best-response schedule. In the left panel of the figure we plot equation (7) on the assumption that (c-a) and (e-2b) are negative. The schedule is positively slopped; the more service American Airline can deliver on the domestic market, the more will it be able to deliver on the international market. Expansion of sales in one geographic area goes hand in hand with greater sales in another region.

The right panel of Figure 1 contains the reaction functions specified by equations (5) and (6). Note that R_1R_1 is steeper than $R^*_{11}R^*_{11}$ which ensures stability of the system. The latter schedule is drawn for equilibrium value of X^*_{12}. Equilibrium in the two markets is shown by E_1 and E_2. It is clear that American Airlines captures more than 50 percent of total traffic in the international market. The greater are the economies of scope, the further away from the origin is R^*_{11} R^*_{11}located.

If e were equal to zero, the international market would be shared equally by the two duopolists.

Equilibrium values for the three endogenous variables can now be written as:

$$(8)\quad X_1 = \frac{2b(c-a)(b-2^e)}{\Delta} \qquad \Delta = (e-2b)[(e-2b)^2-e^2-b^2] < o$$

$$(9)\quad X^*_{11} = \frac{b(c-a)(2b-^e)}{\Delta}$$

$$(10)\quad X^*_{12} = \frac{3b(c-a)(b-e)}{\Delta}$$

In order to get meaningful results I assume that $\Delta < 0$, $(c-a) < 0$ and $(b-2e) < 0$. These assumptions impose restrictions on the intercepts and relative slopes of the demand and marginal costs curves. It can be readily established that the stronger economics of scope are, the larger the equilibrium values of X^*_{11} and X^*_{11} become. The existence of the domestic market allows American Airline to become more competitive abroad. For the same reasons it could be shown that the size of the U.S. domestic market plays the same role as the economics of scope coefficient. One interesting policy conclusion which follows from our analysis is that subsidization of American Airlines in its domestic operations would also help it win a bigger slice of the international market.

3. Volume of International Trade in Services

In order to determine the volume of international trade in services and trade balance, the two demand functions behind equation (2) have to be spelled out. It is also worth remembering that the volume of international trade in air transportation services is less than the sum of X_1 and X^*_{11}. This is so because the transactions involving Swissair and Swiss residents and American Airlines and U.S. nationals do not enter the balance of payments statistics.

Let us first write down the national demand functions for international transportation services. This is done in equations (11) and 12).

$$(11)\quad D^*_{11} = a^* - b^* P^*_1$$

$$(12)\quad D_1 = k(a^* - b^* P^*_1) \qquad \text{where } k > 0$$

The Swiss demand for international flights is a multiple of the U.S. demand. We assume only that $k > o$ but in fact it would be more realistic to set $1 > k > 0$. Adding (11) and (12) together is consistent with (2) provided that $a = a^*/b^*$ and $b = 1/(1+k)b^*$.

The assumed demand functions imply that the U.S. and Swiss shares of the global market for international air transportation are $1/(1+k)$ and $k/(1+k)$, respectively. Now, one additional step is needed to determine the exact volume of services trade and hence trade balance. Let us assume that individuals toss a coin before deciding which airline to take for international flights. Thus the U.S. would be expected to run a trade surplus in services if:

$$(13) \qquad \frac{X_{11}^{*}}{X_1+X_{11}^{*}} > \frac{1}{1+k} \qquad \text{or}$$

$$(14) \qquad \frac{1}{1+\dfrac{2(b-2e)}{(2b-c)}} > \frac{1}{1+k}$$

Condition (14) says that the U.S. will run a trade surplus in services only if $k > 2(b-2e)/(2b-e)$. This result indicates that both economies of scope, captured by e, and the relative country size are important factors in determining which country emerges as the net exporter of services. While the coexistence of scope economies and of a non-traded sector ensures that the U.S. captures more than 50 percent of the world market, this factor has to be weighted against the relative country size. Given the value of e, the larger the United States is (i.e. the smaller is k) the more likely it is that Switzerland will be a net exporter. A small country is well positioned to export more services than it imports precisely because relatively few of its residents demand internationally traded service.

While the net value of trade is exactly determined by our model, the framework, with its random choice of the airline, also suggests that some fluctuations in exports and

imports volumes are to be expected.[9] The point can be made just by establishing the lower and upper limits for Swiss exports of air transportation services. I shall present the argument verbally.

The lower bound for Swiss exports is established by assuming that all Swiss residents demanding international air transportation services first turn to Swissair. From equilibrium condition (8) we know the Swiss supply, X_1, we also know that the Swiss demand is equal to $[k/(1+k)](X_1+X_{11}^*)$. If the former number is smaller than the latter, the Swiss exports equal the difference between the two. Otherwise Switzerland exports nothing.

The upper limit for Swiss exports is established when Swiss residents first turn to American Airlines for service. Comparison of equilibrium quantities of demand and supply would determine the bound precisely. As for the relative magnitude of trade fluctuations, it follows from the Central Limit Theorem that they will have a standard deviation of the order of the square root of the market size.

4. Deregulation of the Domestic Market

Deregulation of domestic markets - for services as well as for goods - can take many different forms. The ones most often used include: abolishment of price fixing schemes, greater flexibility with regard to commissions charged for services rendered, elimination of separation of activities, allowance of new entries and so on. The prime objective of all these measures is to increase the degree of prevailing competition. Each instrument has its individual characteristics which merit special analysis. Yet, for the

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[9] While the volume of exports and imports may fluctuate, the amount of business carried out by each airline is stationary in equilibrium. Trade fluctuations have no negative welfare effects in this case.

purpose of this paper I will consider domestic market deregulation to be synonymous with allowing new entry. To further simplify the analysis the policy will be limited to allowing one additional producer of services to operate in the U.S. domestic market. I introduce this simplification because going for unrestricted free entry until all pure profits are eliminated, would not materially altered our analysis. In fact the conclusions reached in this section would be only reinforced, as shall be demonstrated later.

When a new local airline is permitted to operate in the United States it is restricted to the internal market. It does not automatically gain the right to provide international service. It is of course possible that international negotiations could bring about this result. What I intend to stress, however, is that domestic and international deregulation, although connected, represent two different processes. At the moment, we observe pressures across different service industries working towards domestic and international deregulation. The two processes advance at different speeds. With regard to international deregulation, the world community is still at the "talking" (or even "pre-talking") stage; it is likely that this state will last awhile before concrete result materialize. The discussion stage on desirability of domestic deregulation has been cut short in several Western countries by voters who put conservative governments in power. The implementation stage could thus begin.

Assume therefore that a new airline called Blue Skies Airline is established in the United States.[10] At once it becomes American Airlines's competitor for domestic flights. The assumption that the contenders play the Cournot game continues to hold. Naturally, we must now specify three

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[10] This means that prior to deregulation the incumbent made pure profits. The new entry reduces or eliminates these profits, however, the two firms are assumed at least to break even.

profit functions:

(15) $\Pi_1 = [a-b(X_1+X_{11}^*)]X_1 - TC(X_1)$

(16) $\Pi_1^* = [a-b(X_1+X_{11}^*)]X_{11}^* - [a-b(X_{12}^*+X_2^*)]X_{12}^* - TC(X_{11}^*+X_{12}^*)$

(17) $\Pi_2^* = [a-b(X_{12}^*+X_2^*)X_2^* - TC(X_2^*)$

where X_2^* denotes the amount of services provided by Blue Skies Airline. As before, all the players in the market have access to the same technology. However, only one airline can benefit from economies of scope. Under the present situation, the first order conditions for profit maximization become:

(18) $(e-2b)X_1 - bX_{11}^* = c-a$

(19) $(e-2b)X_{11}^* - bX_1 + eX_{12}^* = c-a$

(20) $(e-2b)X_{12}^* - bX_2^* + eX_{11}^* = c-a$

(21) $(e-2b)X_2^* - bX_{12}^* = c-a$

Casual inspection of the above conditions reveals that the symmetry intentionally built into the model must result in a solution such that $X_1 = X_2^*$ and $X_{11}^* = X_{12}^*$. It follows immediately that equilibrium value of P_1^*, must be equal to equal to P_2^*. The international and domestic markets have become identical twin brothers. The equilibrium quantities of services are given by:

(22) $$X_1 = X_2^* = \frac{(c-a)(2e-b)}{2(e-b)^2-b^2}$$

(23) $$X_{11}^* = X_{12}^* = \frac{(c-a)(e-b)}{2(e-b)^2-b^2}$$

The basic reason for obtaining symmetric solutions is the fact that, as before, the two markets are of identical

size, however, now the degree of competition in the two markets is also the same. Equalization of equilibrium quantities gives rise to equalization of prices. For obvious reasons the domestic price in the U.S. is lower than the price established before deregulation. It could be shown that the process of price equalization across the markets must involve a reduction in the U.S. domestic price accompanied by a rise in the international price.

Comparison of equations (22) and (23) shows that $X_1 = X_2^*$ $< X_{11}^* = X_{12}^*$, that is to say American Airline continues to hold more that 50 percent of each market. In terms of the right panel of Figure 1, the intersection of the two reaction functions must be above the 45° ray from the origin. Although deregulation has eroded American Airlines competitive position by shifting $R_{11}^*R_{11}^*$ closer towards the origin, in the presence of scope economies American Airlines will preserve a greater-than-50-percent share of the market, since it will be the only airline to operate in the domestic as well as in the international market.

It is worth contrasting equations (22)-(23) with (8)-(10). How has the aggregate supply of services in each market changed as the result of deregulation? It can be readily demonstrated that $X_{12}^*+X_2^*$ is greater than the initial value of X_{12}^*. There is more competition in the U.S. domestic market; both price and quantity must move closer to their perfect competition values. Blue Skies Airline has taken away some business from American Airlines so X_{12}^* must be smaller in the deregulated industry.

By being smaller in the domestic market, American Airlines is less competitive at the international level. (This shifts $R_{11}^*R_{11}^*$ inward in Figure 1). Swissair only partially replaces the erosion of the U.S. supply.

The discussion of the effects of deregulation leads us to the following two propositions :

Proposition 1 : Deregulation of the domestic market without an accompanying liberalization of the international market benefits the consumers of the non-traded service and reduces the welfare of the consumers of the internationally traded service.

Proposition 2 : Deregulation of the domestic market may be anti-trade biased; it also reduces net exports of the liberalizing country and increases net exports of its international competitor.

As the two propositions may appear somewhat surprising it is worth elaborating them more fully. Changes in the market structure are bound to have welfare effects. More competition in the domestic market brings welfare benefits to the consumers directly affected by the measure. It does not follow, however, that all consumers are better off. Since we have established that the price of the internationally traded service increases as a result of the domestic deregulation, those consumers who desire only that service are bound to be worse off. This group includes all Swiss residents and one segment of the U.S. consumers.

The effects of deregulation on the welfare of the producers are clear-cut: the new entrant to the market gains, its domestic competitor loses and the foreign producer gains.

Is it possible that the deregulating country's total welfare diminishes? I will not provide a formal proof but the answer must be clearly yes. The gains of the consumers of the non-traded service and its new producer may not be enough to compensate for the losses of the remaining producer and consumers.

The possibility of a welfare loss for the deregulating

country may come as a surprise to policy makers. The common wisdom is that the freer the market the better. Yet, our result is a general application of the second best theory. In the absence of perfect competition across the markets, liberalization of only some of the markets need not get the economy closer to Pareto optimum.

If there is any policy conclusion to be drawn from this model it should be read as follows: To ensure positive gains from deregulation, the international and domestic process of freeing the markets must proceed jointly, for the two tracks are not independent.

Turning to Proposition 2, it also runs against the common wisdom. More competition at home helps exports industries, is an often-heard slogan. The loss of the competitive position on the part of the incumbent firm is the basis for this trade prediction. It could not be too difficult to set up a case where initially the deregulating country is a net exporter of a service but after liberalization it ends up being a net importer. With trade reversal, deregulation may actually be pro-trade biased.

5. A Simulation Exercise

Although the basic results of the model are analytically derived in the previous sections, it may be useful to conduct a simple simulation exercise. I assume that the inverted demand functions used in the analysis have the slope (coefficient b) equal to -1.0 and the intercept (coefficient a) equal to 100. The marginal cost functions are $20-eX_1$ for Swissair (and the same function for Blue Skies Airline when it enters the market), and $20 - e(X^*_{11} + X^*_{12})$ for American Airlines. The main focus of the exercise is on the economics of scope parameter, e. To get a reference case, I initially set e = 0 and then increase this parameter to 0.1 and 0.4. From the restrictions set in the paper, e must be

smaller than 0.5. The results are shown in Table 1.

With e set equal to zero, the international market is split 50-50 between Swissair and American Airlines. The aggregate supply in the world market exceeds that in the U.S. domestic market for the degree of competition in the former is greater that in the latter. As a result the U.S. domestic price initially exceeds the international price. Note that deregulation does not affect world equilibrium in this case. However, it does turn the domestic situation into a mirror image of the international market. Blue Skies Airline plays the role equivalent to Swissair's in limiting the monopoly power of American Airlines.

When parameter e takes on values 0.1 and 0.4, American Airlines share of the world market prior to deregulation increases from 50 percent to 54 percent and then to 80 percent. Entry of Blue Skies Airline leads to a reduction of this share to 53 percent (with e = 0.1) and then to 75 percent (with e = 0.4).[11]

Under strong economies of scope, one can observe a substantial drop in the airfare on domestic flights of about 15 percent. There is, of course, also an increase in the international price but the magnitude of this effect is rather small.

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[11] Note that if no economies of scope were present, the market would be equally divided between the operating firms, no matter what degree of scale economics.

Table 1 Values of endogenous variables

Before deregulation

variable	e = 0	e = 0.1	e = 0.4
X_1	26.67	25.91	14.29
X_{11}^*	26.67	30.76	57.14
X_{12}^*	40.00	43.72	64.29
$X_{11}^*+X_1$	53.34	56.68	71.43
P_1^*	46.67	43.32	28.57
P_2^*	60.00	56.28	35.71

After deregulation

variable	e = 0	e = 0.1	e = 0.4
X_1	26.67	26.45	17.39
X_{11}^*	26.67	29.75	52.17
X_{12}^*	26.67	29.75	52.17
X_2^*	26.67	26.45	17.39
$X_{12}^*+X_2^*$	53.34	56.20	69.56
P_1^*	46.67	43.80	30.44
P_2^*	46.67	43.80	30.44

We have demonstrated a way to determine net trade between the two countries and established a condition under which the U.S. would be a net exporter prior to deregulation. With e = 0.4 this condition is met for k = 0.3 i.e. when the Swiss demand equals 0.3 of the U.S. demand for international service at any given price. Under this situation the United States can be shown to run a surplus of 2.19 (in units of the service) before deregulation. This surplus turns into deficit of 1.34 when the new entry is allowed in the U.S. domestic market.

While the present simulation exercise is interesting and revealing it should be considered for what it really is, just a simulation exercise. One would therefore not wish to draw strong policy conclusions from the obtained results.

6. Effects of Various Policies

This section discusses responses of the model to various changes in policy instruments. In general policy measures can be divided into those which focus directly on the international market and those which apply primarily to the domestic market. I am mainly interested in the latter group here but wish to emphasize the interdependence of the two markets.

To begin with, let's suppose that after deregulation the U.S. government decides to subsidize the domestic carrier. Blue Skies Airline may be perceived as a weak partner to American Airlines with its scope of operation restricted by international agreements. Policy makers may also feel that the market is not big enough for two airlines and the new entrant needs some protection. One way or another, Blue Skies Airline receives a subsidy. The effects are displayed in Figure 2.

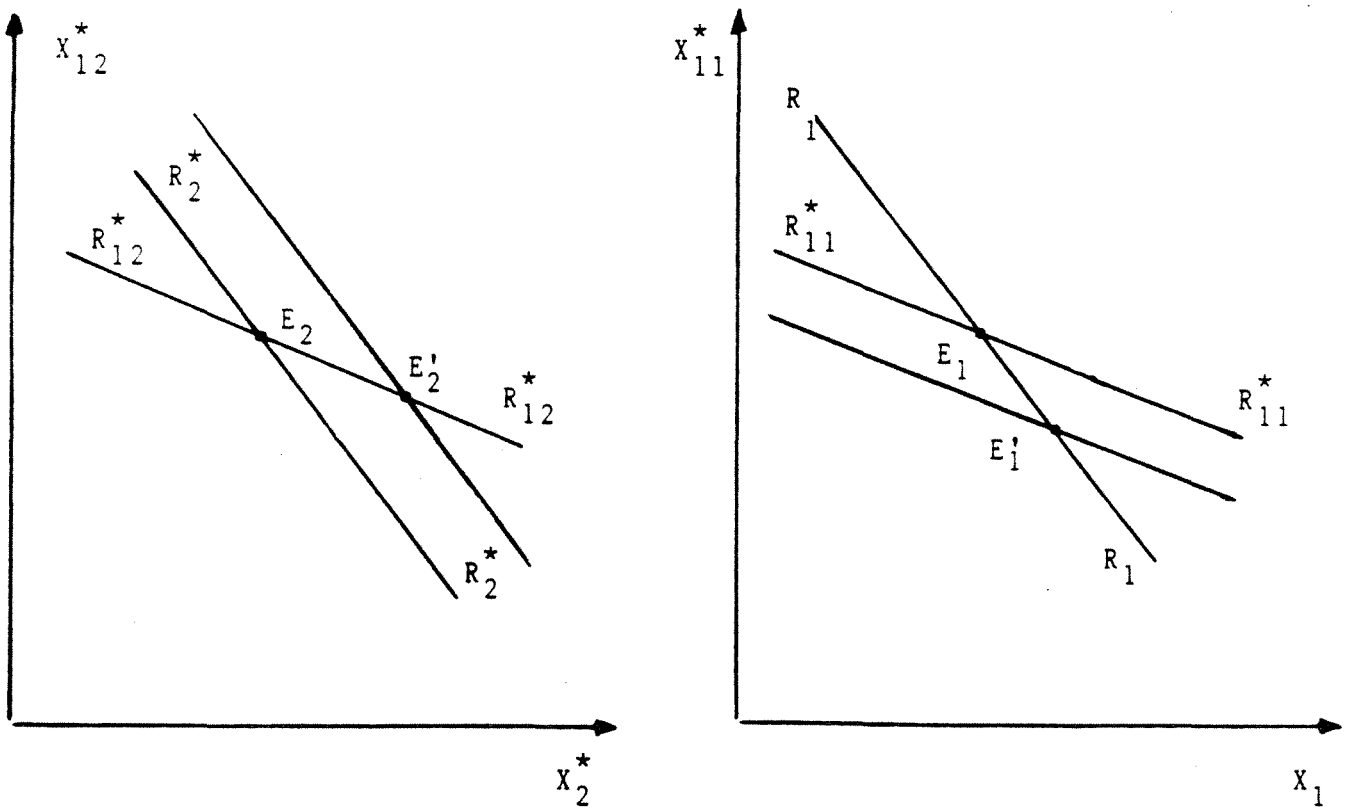

Figure 2

The left panel in Figure 2 shows two reaction functions for the U.S. domestic market and the right panel depicts the international market. The equilibria are, as already discussed, symmetric and given by points E_1 and E_2. It follows from equations (19) and (20) that $R^*_{11}R^*_{11}$ is drawn for the value of X^*_{12}corresponding to equilibrium at E_2, and, corresponding to equilibrium at E_2, and, similarly, $R^*_{12}R^*_{12}$ is depicted for the value of X^*_{11}implied by equilibrium at E_1.

A subsidy for the U.S. domestic airline shift R^*_2 R^*_2 outward with the other schedule remaining intact. It is immediately obvious that such a shift has a feedback effect in the international market. American Airline loses a part of the domestic market, becomes less efficient in its overall activities and hence it poses a less effective threat to Swissair than before. Thus the R^*_{11} R^*_{11} reaction function shifts inward in the right panel.

After taking account of all feedback effects, the final equilibrium can be depicted by E'_1 and E'_2.

It is clear that the U.S. international carrier becomes a loser in both markets. It follows, therefore, that this policy measure erodes the U.S. trade surplus (or accentuates the deficit). In order to help American Airlines and the U.S. trade account, policy makers would have to tax Blue Skies Airline.

A subsidy to the domestic carrier can be contrasted with an across-the-board subsidy. Clearly $R^*_{22}$and $R^*_{12}R^*_{12}$ must shift outward. This measure must help American Airlines in the international market as well, and $R^*_{11}R^*_{11}$ moves away from the origin in the left panel. The U.S. share of the international market increases. It is interesting to ask whether American Airlines share of the domestic market

changes as well. One would tend to think that a non-discriminatory subsidy should shift R_1^*, R_1^*, and $R_2^* R_2^*$ proportionally by the same amount so the new equilibrium would be on the ray from the origin passing through E_2. In fact equilibrium must be above this ray and away from the origin. This is so because the American Airlines gains in the international market make it more competitive at home. So ultimately R_1^*, R_1^* must shift by more than $R_2^* R_2^*$.

So far we have allowed only one new firm to enter the U.S. domestic market. It may well be that deregulation is much more drastic and no limits on entry are imposed. In this case one has to explain the number of firms that will ultimately operate in the market. While this is an interesting problem in itself, it could only make the analysis more complicated. The qualitative results would stand, however. To see this suppose that yet another airline enters the domestic market and with three firms, in addition to Swissair, all pure profits are eliminated in the U.S. airline industry. The new firm would do to American Airlines what the first one did. It would take some business from the existing firms. The international position of American Airline would be further weakened. The international price would tend to increase even more. The domestic price, however, would reach an even lower level than before. (Under the present situation, the two prices would not be equal in equilibrium).

Finally, I briefly consider the consequences of a new international player entering the scene. Suppose that Singapore Airlines literally appears in the sky. Singapore is even smaller that Switzerland and its residents do not even demand international air transportation services. This situation could be easily formalized and the main conclusion could be that the change hurts the U.S. airlines, Swissair and U.S. domestic passengers but benefits international customers.

7. Conclusions

We have used a special, and therefore limited, model to study the problem of interdependence between domestic and international markets. The distinction between tradables and non-tradables has proven very useful in trade theory with regard to goods and it also has interesting implications for analysis of services within the context of non-competitive market structures.

The model has been cast in a partial equilibrium framework but it can be easily turned into a general equilibrium set-up. It suffices to bring in another sector producing goods. The easiest way to accomplish this task is by postulating a Ricardian structure. Production of goods and services requires only one factor of production namely labor. To focus on the market structure as the basis for trade, suppress all technological differences between countries. Under these circumstances, wages are equalized in autarky (between sectors and countries) and yet there is still room for trade. Our discussion of the volume of international trade, Section 3, provides a basis for conjecturing that the relative country size constitutes the sole determinant of the trade pattern.

The assumption of consumers falling neatly into two categories - one demanding domestic, and the other desiring international services - is not as restrictive as it may seem at first blush. This fiction has certainly made the analysis easier, especially with regard to welfare effects because the winners and the losers could be easily identified. Yet one can suppress the two groups of consumers in the large country by postulating the following two-stage Graham demand functions: Total demand for services is a constant fraction of national income i.e. $D^{*}=\alpha Y^{*}$. Next, assume that fraction β of this demand is spent on domestic services and $1-\beta$ on international services. To generalize further, β could be

made a function of the relative price of international to domestic services. These amendments would not substantially alter the main results of our analysis.

The model used here could be also applied to an economy producing goods. In fact, one possible objection to rise with regard to the presentation of the model is that our choice of applying it to services may be somewhat misleading. I plead partly guilty to this charge. My main justification for this particular presentation is that: First, deregulation seems to be more wide-spread in services than in goods. Second, the departures from perfect competition are commonly judged to be more frequent and more pronounced in the tertiary than secondary production. And last but not least, the model requires a dual market structure which leads to price discrimination. At one level domestic and international services presented in this model are one and the same thing and yet producers are charging consumers different prices. One of the characteristics of services is that they generally must be consumed where they are produced. (There are exceptions, of course). This proximity of production and consumption greatly facilitates price discrimination. It is more difficult, but not impossible, to justify market segmentation and price discrimination in the case of goods.

Without any question, the most limiting assumption of the analysis is that of the Cournot strategy. Much has been said about the realism of it, and yet this assumption is frequently used in the industrial organization literature and, now, in "new" trade models.

It is generally recognized that models of imperfect competition are very fragile with regard to the basic assumptions. Without reworking the model in a Bertrand or a Stackelberg setting, I only want to point out that the conflict between domestic deregulation and international liberalization can arise whether competition is in quantities or in prices. The basic source of the conflict is the

existence of economies of scope and the second-best character of initial and ultimate market structure.

By studying the effects of domestic market deregulation in the context of an open economy, we have succeeded in bringing new and possibly important considerations, especially welfare and balance of payments effects, into the analysis. Domestic deregulators may well wish to take into account these international implications of their policies.

International trade theory has run up a considerable debt vis-à-vis industrial organization in recent years. There is a chance that international economists can start paying back, if not the debt itself, then at least interest rates payments which is already quite a lot in the contemporary world.

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